

Species and Numbers of Bloodsucking Flies Feeding on Hogs and Other Animals in Southern New Jersey^{1,2}

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RECEIVED FOR PUBLICATION JANUARY 20, 1975

Abstract: Tabanidae of 19 species were recorded feeding on hogs of 8 herds in 1973. Species and feeding location on the animals were recorded. Though small numbers of tabanids fed on hogs, herds in wooded areas were more subject to attack by Tabanidae and *Stomoxys calcitrans* than those in open fields. *Stomoxys calcitrans*, *Haematobia irritans*, and 13 Tabanidae were noted on horses, 2 Tabanidae on goats and 6 on dogs.

In areas adjacent to the New Jersey coastal wetlands, female horse flies and deer flies are serious pests of domestic animals and man. Recently Tidwell et al (1972) reported the capability of Tabanidae in transmitting hog cholera and named 8 different *Tabanus* species feeding on North Carolina hogs under field and laboratory conditions. The present study sought to identify the species and assess the numbers of Tabanidae found on hogs and other animals under farm conditions in New Jersey.

MATERIALS AND METHODS

Eight New Jersey farms, including 7 located in Cumberland and 1 in Cape May county, were visited at least twice a week from June 6 to August 10, 1973. At each location, 20 hogs were chosen randomly and counts of feeding Tabanidae and *Stomoxys calcitrans* were made. The appearance of the animal was also noted—clean, dirty or muddy—as well as whether it was in the sun, shade or shelter. Not only were numbers of flies tabulated, but also on which part of the hogs' body a particular fly was feeding. A portion of the flies were collected and identified in the laboratory to confirm field identification. Whenever an unfamiliar fly was seen, a special effort was made to capture it. Only once during the season did such a fly escape. This particular fly was recognized as a *Chrysops* species.

Black box traps such as that described by Decoster (1968) were set up at 5 farms to monitor the fly population. Beach balls sprayed black were used

¹ Diptera: Tabanidae, Muscidae.

² Paper of the Journal Series, New Jersey Agricultural Experiment Station, Rutgers University—The State University of New Jersey, New Brunswick, N.J. This investigation is part of an undergraduate George H. Cook Scholar Project and was supported in part by USDA—APHIS, Contract No. 12-16-100-189.

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TABLE 1. Numbers of Tabanidae species collected from hogs and box traps throughout the summer of 1973 in southern New Jersey.

| Species | Number on Hogs | Number in Traps |
|--|----------------|-----------------|
| <i>Tabanus lineola</i> F. | 306 | 1515 |
| <i>T. nigrovittatus</i> Macquart | 136 | 554 |
| <i>T. atratus</i> Fabricius | 88 | 3 |
| <i>T. trimaculatus</i> Palisot de Beauvois | 26 | 21 |
| <i>Chrysops fuliginosus</i> Wiedemann | 20 | 0 |
| <i>C. niger</i> Macquart | 11 | 0 |
| <i>C. cincticornis</i> Walker | 7 | 1 |
| <i>C. atlanticus</i> Pechuman | 1 | 41 |
| <i>C. montanus</i> Osten Sacken | 0 | 15 |
| <i>T. nigripes</i> Wiedemann | 6 | 16 |
| <i>T. pumilus</i> Macquart | 2 | 53 |
| <i>T. melanocerus</i> Wiedemann | 1 | 21 |
| <i>Diachlorus ferrugatus</i> (F.) | 4 | 21 |
| <i>T. sparus milleri</i> Whitney | 1 | 0 |
| <i>T. americanus</i> Forster | 2 | 1 |
| <i>T. imitans</i> Walker ¹ | 1 | 0 |
| <i>T. sulcifrons</i> Macquart | 0 | 1 |
| <i>Hybomitra daeckei</i> (Hine) | 19 | 2 |
| <i>H. lasiophthalma</i> (Macquart) | 4 | 0 |
| <i>C. obsoletus</i> Wiedemann | 1 | 9 |
| <i>C. dimmocki</i> Hine | 1 | 4 |
| <i>C. flavidus</i> Wiedemann | 0 | 6 |
| <i>C. brunneus</i> Hine | 0 | 2 |
| <i>C. vittatus</i> Wiedemann | 0 | 2 |
| <i>C. celatus</i> Pechuman | 0 | 1 |
| <i>C. geminatus</i> Wiedemann | 0 | 1 |
| <i>Stomoxys calcitrans</i> (L.) | 3119 | 302 |

¹The first recorded specimen found north of Maryland—identification made by L. L. Pechuman, Cornell University.

as targets hung under the traps. Each time these farms were visited, trapped flies were collected and later identified.

Clean clothing was worn at all times and rubber boots were disinfected before and after visiting each location.

RESULTS

Hogs. Of the 19 Tabanidae species (Table 1) found to feed on hogs in southern New Jersey, *Tabanus lineola*, *T. nigrovittatus* and *T. atratus* fed in the largest numbers. *T. lineola* made up 48% of the total number of horse flies counted on the animals and 66% of those Tabanidae collected from the box traps. *T. nigrovittatus* contributed 21% and 24% of these totals, respectively. *T. atratus* fed freely on the hogs but would rarely enter the traps.

TABLE 2. Comparison of the number of Tabanidae and *Stomoxys calcitrans* found on hogs in woods versus fields, Cumberland County, N.J.

| Farms | Tabanidae | Total Tabanidae/Hog | <i>Stomoxys</i> | Total <i>Stomoxys</i> /Hog |
|------------|-----------|------------------------|-----------------|-------------------------------|
| A (woods) | 99 | 0.29 | 1359 | 4.00 |
| C (woods) | 13 | 0.04 | 182 | 0.61 |
| D (fields) | 4 | 0.01 | 25 | 0.08 |
| F (woods) | 169 | 0.56 | 168 | 0.56 |
| F (fields) | 117 | 0.34 | 697 | 2.05 |

The number of deer flies feeding was generally lower than the horse flies. *Chrysops fuliginosus*, *C. niger* and *C. cincticornis* were those species which fed most frequently. *Chrysops atlanticus*, *C. montanus*, *T. nigripes*, *T. pumilus*, *T. melanocarus* and *Diachlorus ferrugatus* were present in the vicinity of the hogs in substantial numbers but were not inclined to feed. The stable fly, *Stomoxys calcitrans*, was more common on the hogs than any of the tabanids and made up 83% of the flies found in the box traps.

The stable fly was present throughout the entire season and fed all over the body of the hog, as did most of the *Tabanus* spp. However, *T. atratus* concentrated on the back of the animal and *T. trimaculatus* had a predilection for the sides and legs. *Hybomitra lasiophthalma* fed on the legs and *Diachlorus ferrugatus* fed only on the lower half of the pig. The feeding activity of most *Chrysops* spp. was limited to the hog's back.

In general, more Tabanidae and *S. calcitrans* fed on animals kept in wooded

TABLE 3. Species and numbers of Tabanidae found on hogs in the fields and woods of Farm F.

| Species | Fields (17) ¹ | Woods (15) ¹ |
|------------------------------|--------------------------|-------------------------|
| <i>Tabanus lineola</i> | 61 | 95 |
| <i>T. atratus</i> | 37 | 25 |
| <i>T. nigrovittatus</i> | 14 | 10 |
| <i>T. trimaculatus</i> | | 4 |
| <i>T. nigripes</i> | | 2 |
| <i>T. americanus</i> | | 1 |
| <i>Chrysops niger</i> | 1 | 10 |
| <i>C. cincticornis</i> | | 4 |
| <i>C. atlanticus</i> | | 1 |
| <i>Hybomitra daeckei</i> | 4 | 15 |
| <i>H. lasiophthalma</i> | | 1 |
| <i>Diachlorus ferrugatus</i> | | 1 |

¹ Number of visits.

TABLE 4. Numbers of Tabanidae species, *Stomoxys calcitrans*, and *Haematobia irritans* collected from horses during the summer of 1973 in Millville, New Jersey.

| Species | Number on Horses |
|--|------------------|
| <i>Chrysops niger</i> | 4 |
| <i>Tabanus lineola</i> | 543 |
| <i>T. atratus</i> | 43 |
| ¹ <i>T. fulvulus</i> Wiedemann | 10 |
| <i>T. nigripes</i> | 10 |
| <i>T. americanus</i> | 4 |
| <i>Hybomitra lasiophthalma</i> | 4 |
| ¹ <i>T. petiolatus</i> Hine | 2 |
| <i>T. pumilus</i> | 1 |
| ¹ <i>H. cincta</i> (F.) | 1 |
| <i>T. nigrovittatus</i> | 1 |
| <i>H. daeckei</i> | 1 |
| ¹ <i>H. trispila</i> (Wiedemann) | 2 |
| ¹ <i>T. pallidescens</i> Philip | 1 |
| ¹ <i>T. stygius</i> Say | 1 |
| <i>Stomoxys calcitrans</i> | 1376 |
| ¹ <i>Haematobia irritans</i> (L.) | 54 |

¹ Not seen on hogs.

areas than in non-wooded areas (Table 2). This trend is shown for farms C and D located in Cedarville and 0.5 mile apart. The wooded farm C had 4 Tabanidae and 61 *S. calcitrans* for every 100 hogs compared to 1 Tabanidae and 8 *S. calcitrans* in the field of farm D.

Farm F was unique in that it had 2 distinct herds separated by 0.7 mile. The wooded area had 56 tabanids and 56 stable flies feeding on every 100 pigs, whereas the field area had 34 tabanids and 205 stable flies per 100 pigs. *S. calcitrans* showed a greater tendency to enter shelters than the tabanids. This is a possible explanation for the more abundant stable flies found feeding in the field of farm F. Each time this area was visited counts were taken from hogs maintained in 2 pens. One pen contained the younger and smaller animals while the other housed the larger breeding sows which stayed inside a shelter with one completely open side. The *S. calcitrans* were largely on the breeding sows inside the shelter. Throughout the summer only 3 Tabanidae entered the shelter to obtain a blood meal, namely *T. lineola*, *T. nigrovittatus*, and *T. atratus*. In addition to finding larger numbers of flies feeding on hogs housed in wooded areas, more species were also found (Table 3).

Only 5 horse fly species fed on swine in the fields of farm F while 12 species were found in its wooded area. The smaller number of *T. atratus* and *T. nigrovittatus* found in the woods is because the hogs in this area were removed on July 24 (due to theft), whereas counts on the swine in the fields continued

until August 10 and on that particular day 11 *T. atratus* and 7 *T. nigrovittatus* were seen. The most abundant species in both areas were *T. lineola* and *T. nigrovittatus*.

The 7 Tabanidae species which appeared in South Jersey early in the season were: *Chrysops cincticornis*, *C. fuliginosus*, *C. niger*, *Tabanus nigripes*, *T. trimaculatus*, *Hybomitra dacckeii* and *H. lasiophthalma*. Those ubiquitous species present throughout the entire summer were *Tabanus lineola*, *T. nigrovittatus* and *T. atratus*.

Horses. A horse ranch located in Millville, New Jersey was observed 13 times during June to August 1973. Fifteen horses were chosen at random and feeding flies were counted.

In addition to *Stomoxys calcitrans* and *Haematobia irritans*, 15 species of Tabanidae were recorded on horses (Table 4).

Chrysops niger fed on the head and neck of the horse. *Tabanus lineola* and *T. fulvulus* fed on the legs while *T. nigripes* fed on the upper part of the animal (head, neck and side). *T. atratus* was counted on the back and legs and *Hybomitra lasiophthalma* in the genital area. *S. calcitrans* fed all over the horse but predominantly on the side and legs, while *H. irritans* fed on the horse's belly.

Present throughout the season were *Tabanus lineola*, *T. atratus*, *T. nigripes*, *S. calcitrans* and *H. irritans*.

While riding in wooded areas in the evening the senior author noted feeding on the horse's ears by *Chrysops macquarti*, *C. nigribimbo*, *C. vittatus* and *C. celatus*.

Other Animals. On hog farm A, where 9 different Tabanidae species were recorded on hogs, observations were also made of those flies found on 8 goats and 2 dogs.

The total number of flies attracted to the goats included 2 *C. fuliginosus*, 1 *T. nigrovittatus* and 28 *S. calcitrans*. The dachshund, kept in an open area, had 1 *T. nigrovittatus* and 18 *S. calcitrans*. The German shepherd, kept in a wooded area, had 24 *T. nigrovittatus*, 353 *S. calcitrans*, 2 *C. atlanticus*, 2 *C. vittatus* and 1 each of *C. callidus* Osten Sacken, *C. fuliginosus* and *C. montanus*.

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